



**ASBESTOS IS
REGULATED**



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WHAT IS ASBESTOS

- Asbestos is a fibrous material. It occurs naturally in many parts of the world.
- There are 6 main types regulated by EPA/OSHA:
 - Chrysotile_____White Asbestos
 - Amosite_____Brown Asbestos
 - Crocidolite_____Blue Asbestos
 - Tremolite_____Cream Asbestos
 - Actinolite_____Green Asbestos
 - Anthophyllite_____Off-White Asbestos

NATURALLY OCCURRING ASBESTOS



NATURALLY OCCURRING ASBESTOS (CONTINUED)



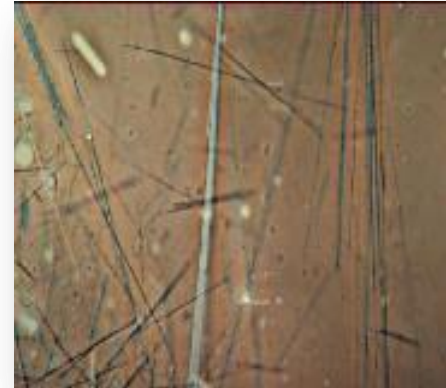
NATURALLY OCCURRING ASBESTOS (CONTINUED)



WHAT IS ASBESTOS

All forms of asbestos tend to break into very tiny fibers. These individual fibers are so small they must be identified under microscope.

In fact, some individual fibers may be up to 700 times smaller than a human hair. Because the fibers are so small, once released into the air, they may stay suspended there for hours or even days.



**Asbestos fibers are
identified using a
microscope**

WHAT IS ASBESTOS?

Asbestos fibers are virtually indestructible. They are resistant to chemicals and heat, and they are very stable in the environment.

They do not evaporate into air or dissolve in water, and they are not broken down over time. Asbestos is probably the best insulator known to man.

Because asbestos has so many useful properties, it has been used in over 4,000 different products. Usually asbestos is mixed with other materials to actually form other products. Floor tiles, for example, may contain only a small percentage of asbestos. Depending on what the product is, the amount of asbestos in asbestos-containing materials (ACM) may vary from 1% to 100%.



APPLICABLE REGULATIONS

Federal and state statutes and regulations apply to the renovation and demolition of facilities involving asbestos-containing materials (ACM).

National Emission Standards for Hazardous Air Pollutants (NESHAP):

§ 61.141 - § 61.154 Renovations and Demolition

Occupational Safety & Health (OSHA) or Virginia Occupational Safety & Health (VOSH) for Asbestos:

29 CFR 1926.1101 (Construction Industry)

29 CFR 1910.1001 (General Industry)

Keep in mind, if a project is exempt from the NESHAP requirements, the employer/employees may still be subject to the VOSH requirements.

NESHAP REQUIREMENTS

Renovations and Demolition

NESHAP HISTORY

- In 1971, following the realization that an increasingly widespread use of asbestos in manufactured products had resulted in a measurable increase of asbestos fibers in the air, the Environmental Protection Agency (EPA) listed asbestos as a hazardous air pollutant (HAP).
- On April 6, 1973, EPA first promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Asbestos (40 CFR Part 61).
- On November 20, 1990, the EPA published substantial revisions to the NESHAP, which remain in effect today.

NESHAP OVERVIEW

- The Asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations and buildings (excluding residential buildings that have four or fewer dwelling units).
- In addition, the regulations require the owner of the building and/or the contractor to notify applicable State and local agencies and/or EPA regional offices before all demolitions or before renovations of buildings that contain a certain threshold amount of asbestos.
- The EPA has delegated the authority to the Virginia Department of Labor (DOL) to enforce the NESHAP in Virginia.

NESHAP APPLICABILITY



Three Questions:

1

Is the activity a demolition or a renovation?

2

Does the project meet the definition of facility?

3

Does the amount of **regulated** asbestos-containing materials (RACM) meet or exceed the threshold?

NESHAP APPLICABILITY

- Facilities are defined as:
 - All public, commercial, industrial, or institutional structures, ships, bridges, active or inactive waste disposal sites
 - Residential buildings with more than four units
 - Single family homes to be burned for training purposes
 - One, two or more single family homes on a single site to be demolished or renovated for commercial purposes
- Applies jointly to owners and operators at a facility
- Schools are subject to additional EPA requirements under the Asbestos Hazard Emergency Response Act (AHERA)

NESHAP FACILITY EXEMPTIONS

- **Residential Structures**

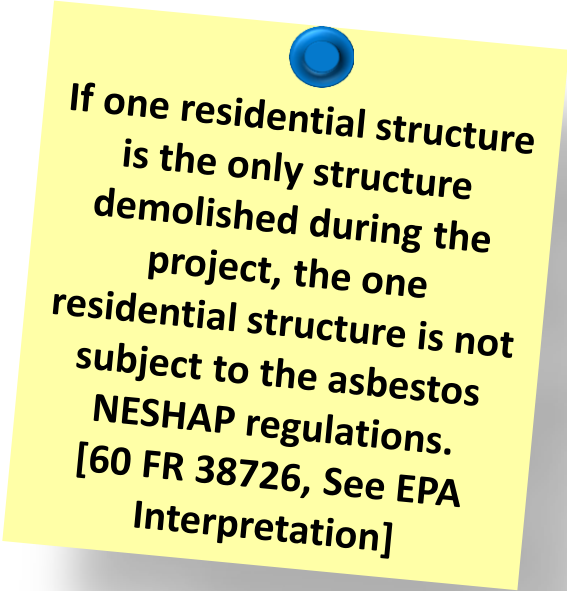
- The owner of a home that renovates his/her house or demolishes it to construct another house would not be subject to the NESHAP.
- Four or fewer dwellings being renovated or demolished that are owned by the same owner.

- **Residential structures that are demolished or renovated as part of commercial or public projects are subject to the NESHAP.**

- For example, the demolition of one or more houses as part of an urban renewal project, a highway construction project, or a project to develop a shopping mall, industrial facility, or other private development would be subject to the NESHAP.
- The houses in an urban renewal project need not be contiguous to each other to be subject to the NESHAP.

HIGHWAY PROJECTS

- In the case of a highway expansion, one entity, e.g., the state highway department and/or the demolition contractor, owns or has control over the residential structures to be demolished.
- These residential structures are subject to the asbestos NESHAP regulations.



If one residential structure is the only structure demolished during the project, the one residential structure is not subject to the asbestos NESHAP regulations. [60 FR 38726, See EPA Interpretation]

NESHAP APPLICABILITY

- Determine if the amounts of RACM is at or above the thresholds:

LOCATION OF ASBESTOS	THRESHOLD LEVEL OF RACM
Pipe	260 Linear Feet (EPA) 10 Linear Feet (VA)
Other Facility Components	160 square feet (EPA) 10 square feet (VA)
ACM that has been already removed but not already measured	35 cubic feet (EPA) 10 cubic feet (VA)

NOTE: The volume requirement was established to assist VOSH with compliance evaluations when the ACM has already been removed from a facility.

WHAT IS RACM?

- Any material with greater (>) than 1% asbestos is considered an “**asbestos-containing material**” (ACM).
- **NESHAP** applies to regulated asbestos-containing materials (RACM) and includes:
 - a Friable asbestos material
 - b Category 1 non-friable ACM that has become friable
 - c Category 1 non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading
 - d Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material during demolition or renovation

NOTE: The NESHAP is not limited to material that is friable at the time of notification. If at any point during the renovation or demolition, additional friable asbestos material is created from non-friable forms, then this additional friable material becomes subject to the regulations from the time of creation.

FRIABLE

- **Friable asbestos material** means any material containing more than 1% asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763 section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
- If the asbestos content is less than 10% as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

DAMAGED FRIABLE ASBESTOS



DAMAGED FRIABLE ASBESTOS



FRIABLE ASBESTOS



DAMAGED FRIABLE ASBESTOS



FRIABLE ASBESTOS



CATEGORY I AND II

- **Category I Non-friable ACM** means asbestos containing packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, Section 1, Polarized Light Microscopy.
- **Category II Non-friable ACM** means any material, excluding Category I non-friable ACM, containing more than 1% asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

NON-FRIABLE ASBESTOS

- Some non-friable materials may remain non-friable throughout demolition and renovation.
- Resilient floor covering, asphalt roofing products, packings, and gaskets would rarely, if ever, need to be removed because, even when broken or damaged, they would not release significant amounts of asbestos fibers.
- However, the deliberate sanding, grinding, or abrading of the non-friable materials listed above is equivalent to disturbing friable ACM and, therefore, requires these activities be subject to the NESHAP.

NON-FRIABLE ASBETOS

- Some non-friable materials should always be removed prior to demolition if, as a result of the forces of demolition, non-friable material is likely to become crumbled, pulverized, or reduced to powder.
- For example, the A/C siding on a building that is to be demolished using a wrecking ball is very likely to be crumbled or pulverized with increased potential for the release of significant levels of asbestos fibers. Such material in this instance should be removed prior to demolition.

NON-FRIABLE ASBETOS



**ASBESTOS CEMENT
ROOF SHINGLES AND
FELT (TAR PAPER)**



**GRAY COLOR TAR PATCHING
MASTIC ON ROOFING SEAMS
AND PARAPET**



NON-FRIABLE ASBETOS



**VINYL SHEET FLOORING
(MOSAIC PATTERN)**



**9" VINYL ASBESTOS TILE (LEFT) AND
BLACK ASBESTOS MASTIC (BELOW)
EXPOSED DURING CARPET REMOVAL)**



SIDING NON-FRIABLE ASBETOS



OSHA DEFINITION

- OSHA has a broader set of definitions than the NESHAP.
- NESHAP is concerned with the materials that contain >1% asbestos
- OSHA/VOSH standards regulate all ACM
- The definition of asbestos under OSHA does not have a 1% cut-off, therefore, materials that have <1% asbestos continue to be covered by the OSHA/VOSH standards.
- Work operations conducted in areas containing materials with <1% asbestos are considered “unclassified” operations.

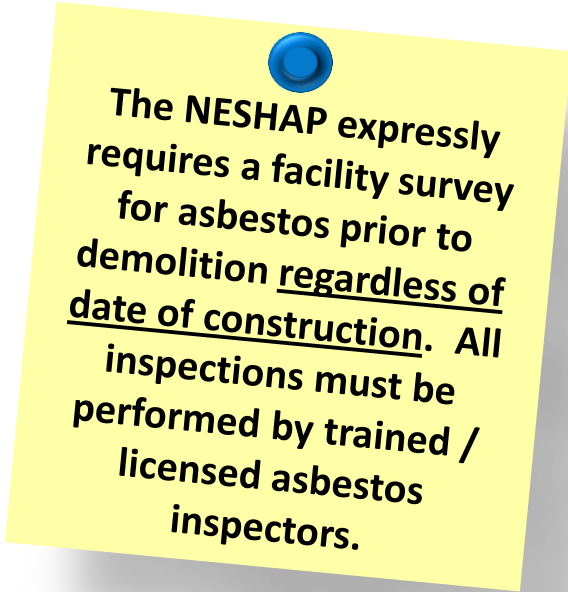


It is important to keep in mind for operations that may be exempt from the NESHAP they may be subject to OSHA/VOSH requirements.

INSPECTION REQUIREMENTS NESHAP

- To determine the applicability of the NESHAP:

“the owner or operator of a demolition or renovation activity and prior to the commencement of the demolition or renovation thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos, including Category I and Category II non-friable ACM”.



The NESHAP expressly requires a facility survey for asbestos prior to demolition regardless of date of construction. All inspections must be performed by trained / licensed asbestos inspectors.

INSPECTION REQUIREMENTS VIRGINIA CODE

- § 36-99.7. Asbestos inspection in buildings to be renovated or demolished; exceptions.
- A A local building department shall not issue a building permit allowing a building for which an initial building permit was issued before **January 1, 1985**, to be renovated or demolished until the local building department receives certification from the owner or his agent that the affected portions of the building have been inspected for the presence of asbestos by an individual licensed to perform such inspections pursuant to § § 54.1-503 and that no asbestos-containing materials were found or that appropriate response actions will be undertaken in accordance with the requirements of the Clean Air Act National Emission Standard for the Hazardous Air Pollutant (NESHAP) (40 CFR 61, Subpart M), and the asbestos worker protection requirements established by the U.S. Occupational Safety and Health Administration for construction workers (29 CFR 1926.1101).

INSPECTION REQUIREMENTS VIRGINIA CODE

- § 36-99.7. Asbestos inspection in buildings to be renovated or demolished; exceptions.
- **B** To meet the inspection requirements of subsection A except with respect to schools, asbestos inspection of renovation projects consisting only of repair or replacement of roofing, floor covering, or siding materials may be satisfied by a statement that the materials to be repaired or replaced are assumed to contain friable asbestos and that asbestos installation, removal or encapsulation will be accomplished by a licensed asbestos contractor.

INSPECTION REQUIREMENTS VIRGINIA CODE

- § 36-99.7. Asbestos inspection in buildings to be renovated or demolished; exceptions.
- C The provisions of this section shall not apply to single-family dwellings or residential housing with four or fewer units, unless the renovation or demolition of such buildings is for commercial or public development purposes.

The provisions of this section shall not apply if the combined amount of regulated asbestos-containing material involved in the renovation or demolition is less than 260 linear feet on pipes or less than 160 square feet on other facility components or less than 35 cubic feet off facility components where the length or area could not be measured previously.

INSPECTION REQUIREMENTS VIRGINIA CODE

- § 36-99.7. Asbestos inspection in buildings to be renovated or demolished; exceptions.
- **D** An abatement area shall not be reoccupied until the building official receives certification from the owner that the response actions have been completed and final clearances have been measured. The final clearance levels for re-occupancy of the abatement area shall be 0.01 or fewer asbestos fibers per cubic centimeter if determined by Phase Contrast Microscopy analysis (PCM) or 70 or fewer structures per square millimeter if determined by Transmission Electron Microscopy analysis (TEM).

VIRGINIA CODE AND 1985

- EPA issued a policy determination in 1985, regarding the removal of non-friable asbestos material prior to renovation or demolition activities.
 - This policy determination stated in essence that friable material and non-friable material that become (or are likely to become) crumbled, pulverized, or reduced to powder are covered by the NESHAP.
- For whatever reasons, the Virginia Code citation incorporated the date of this policy as the cut-off date for the requirement of asbestos inspections under the building code.
- HOWEVER, the NESHAP still requires an asbestos inspection prior to **any** demolition or renovation activities regardless of the date of construction.

INSPECTION EXEMPTIONS

- While privately owned residences may be exempt from the inspection and notification requirements under the NESHAP, contractors who are hired to perform the work may still be subject to the requirements under VOSH. Under these circumstances, an asbestos survey is required to identify the presence of ACM in the facility.

SUSPECT ACM

- Fire Doors
- Elevator Equipment Panels
- Elevator Brake Shoes
- HVAC Duct Insulation
- Boiler Insulation
- Breeching Insulation
- Duct Flexible Connectors
- Cooling Towers
- Joint/Spackling Compounds
- Vinyl Wall Coverings
- Pipe Insulation
- Heating/Electrical Ducts
- Electrical Panel Partitions
- Electrical Cloth
- Electric Wiring Insulation
- Chalkboards
- Roof Shingles/Felts
- Base Flashing
- Thermal Paper Products
- Caulking/Putty/Adhesive
- Wallboard

SUSPECT ACM

- Cement Pipes
- Cement Siding
- Cement Wallboard
- Asphalt Floor Tile
- Vinyl Sheet Flooring
- Vinyl Floor Tile
- Flooring Backing
- Construction Mastics
- Acoustical & Decorative
- Plaster
- Textured Paints and Coatings
- Ceiling Tiles/Lay-in Panels
- Sprayed/Blown-in Insulation
- Taping Compounds
- Fireproofing Materials
- Wall Packing Materials
- High Temperature Gaskets
- Lab Hoods/Benches/Gloves
- Fire Blankets/Curtains

ASBESTOS ON HEAT & AIR CONDITIONER COMPONENTS



**SEAM TAPE ON FURNACE
DUCT (BOAT WORKS,
HOPKINS MARINE
STATION)**

**ASBESTOS CLOTH AT
EXHAUST DUCT & FAN
CONNECTION (HERRIN
LAB)**



ASBESTOS WALL AND CEILING MATERIALS

**JOINT COMPOUND
OVER SHEETROCK
WALLBOARD
(COWELL STUDENT
HEALTH CENTER)**



**SPRAY-APPLIED
ACCOUSTIC CEILING
PLASTER
(MIRRIELES)**

ASBESTOS IN FIRE DOORS



ASBESTOS CEILING MATERIALS



**LAY-IN ACOUSTIC
CEILING TILE**

**GLUE-ON
ACOUSTIC CEILING
TILE & EXPOSED
BROWN MASTIC**



NON-FRIABLE ASBESTOS



**ASBESTOS CEMENT (AC)
PIPE**



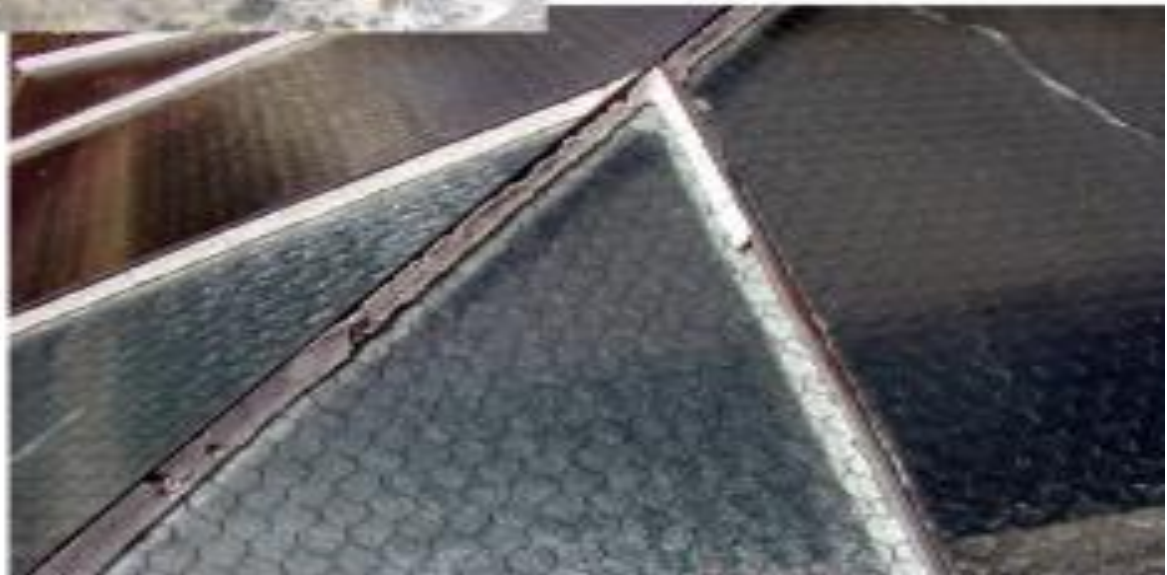
**ASBESTOS CEMENT LAB
FUME HOOD EXHAUST
DUCT**

NON-FRIABLE ASBESTOS



**BROWN CAULK AT PIPE
PENETRATION**

**GLAZING (WHITE)
ON SKYLIGHT
WINDOWS**



ATTIC INSULATION



**LOOSE FILL ASBESTOS INSULATION
IN THE CEILING OF A HOME**



LAB REPORT

- The lab should report the results as follows:

ASBESTOS CONTENT IN MATERIAL	RESULT
> 1%	Positive
< 1% "Trace"	Non-ACM ¹
No Trace	Negative

¹ These materials are still regulated under VOSH in regard to work practices and exposure control techniques.

NOTIFICATIONS

- To ensure the building owner or demolition contractor has accurately evaluated the site for the presence of asbestos, the EPA and DOLI must be notified prior to the onset of any demolition.
- Whether asbestos is present or not, the owner or operator of a facility that will be demolished must submit a NESHAP notification to VOSH and EPA 10 working days prior to any demolition (except exempt residential structures).
- Owner or operator shall mean any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

NOTIFICATIONS

- The owner/operator is required to provide **updated** notifications when:
 - The amount of asbestos affected changes by at least 20%.
 - When the start date changes.
 - When the times of removal changes.

ABATEMENT PRIOR TO DEMOLITION

- Remove all RACM from a facility being demolished or renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal.

INTENTIONAL BURNING

- If a facility is demolished by intentional burning, all RACM, including Category I and Category II non-friable ACM, must be removed in accordance with the NESHAP before burning.
- Abandoned buildings utilized by fire departments for fire training exercises involving partial burning are also subject to this requirement.

ACM SUBJECTED TO FIRE

- For buildings which are still structurally sound but which have previously been subjected to partial or total, intentional or unintentional burning, an inspection for the condition of all ACM should be conducted.
- Category I ACM should be examined for friability and condition. Friable materials or Category I materials that are friable and in poor condition must be removed prior to any further demolition activity.

ASBESTOS Q & A



How can you tell if there is asbestos in a material?



The manufacturer, product literature or product labeling may identify the asbestos content.

People with experience working with or evaluating asbestos-containing materials may be able to identify an asbestos-containing material by visual inspection.

The definitive way to determine the asbestos content of a material is to have a qualified inspector sample the material and have it analyzed by a laboratory qualified to perform asbestos analysis.

ASBESTOS Q & A



Are all asbestos-containing materials a health risk?



No. A health risk only exists when asbestos fibers are released from a product or material and are present in the air for people to breathe.

Soft, easily crumbled materials have the greatest potential for fiber release, and therefore, have the greatest potential to create health risks.

ASBESTOS Q & A



Do all people exposed to asbestos develop asbestos-related disease?



No. Most people exposed to small amounts of asbestos do not develop any health-related problems. Health studies of asbestos workers show, however, that the greater the exposure to asbestos, the greater the risk of developing asbestos-related disease.

ASBESTOS Q & A



Should all asbestos be removed from a building?



No. Regulations require that asbestos-containing materials be maintained in an intact and sealed condition. Scientists say that managing asbestos in-place is a prudent approach to minimizing hazards posed by asbestos.

Any disturbance of asbestos requires trained and certified personnel, as well as the mandatory use of engineering controls and work practices to prevent or minimize exposure to asbestos.

ASBESTOS Q & A



Can anyone work with asbestos?



No. People who work with asbestos must be trained and certified in proper asbestos abatement work practices.

Asbestos workers must participate in a medical surveillance program and must be qualified and approved to use respiratory protection.

Contractors must be licensed to perform asbestos abatement.

All consultants who perform inspection and sampling, design abatement projects and monitor the performance of abatement must be specially trained and certified to perform this work.

ATTEMPTS TO BAN ASBESTOS

- Contrary to general belief, it is still legal in the United States to import, process, manufacture and use asbestos-containing products for certain limited uses.
- Since the early 1970's the federal government has attempted, with mixed success, to ban different applications and uses of asbestos.
- In 2007, Washington Senator Pat Murray and Minnesota Representative Betty McCollum introduced companion bills in the Senate and House to amend TSCA and to ban all production and use of asbestos in America. The House Bill version did not make it out of the house subcommittee.
- Since 2007, several versions have been re-introduced in the Senate and House but no bill has been passed to date.

ASBESTOS – LIMITED BANS



What are the current bans that are in effect?



Under the Clean Air Act:

- Sprayed-on application of materials containing more than 1% asbestos to buildings, structures, pipes, and conduits unless the material is encapsulated with a bituminous or resinous binder during spraying and the materials are not friable after drying.
- Wet applied and pre-formed asbestos pipe insulation, and pre-formed asbestos block insulation on boilers and hot water tanks.

Under the Toxic Substances Control Act (TSCA):

- Corrugated paper, rollboard, commercial paper, specialty paper, flooring felt and new uses of asbestos.

ASBESTOS IS STILL WIDESPREAD

- Asbestos is present in many buildings across the country and is still used in some building materials.
- For example, a 1984 building study by EPA found that, on average, 20% of all buildings in the United States contained asbestos. These averages were higher for some cities.
- A 1988 building survey found that, overall, 68% of the buildings in New York City contained asbestos.

ASBESTOS IS STILL WIDESPREAD

- The following products, even when purchased new, may still contain asbestos:
 - Asbestos-Cement Corrugated Sheet
 - Asbestos-Cement Flat Sheet
 - Asbestos Clothing
 - Pipeline Wrap
 - Roofing Felt
 - Vinyl-Asbestos Floor Tile
 - Asbestos-Cement Shingle
 - Millboard
 - Asbestos-Cement Pipe
 - Automatic Transmission Components
 - Clutch Facings
 - Friction Materials
 - Disc Brake Pads
 - Drum Brake Linings
 - Brake Blocks
 - Gaskets
 - Non-Roofing Coatings
 - Roof Coatings

ASBESTOS IS STILL WIDESPREAD

- EPA doesn't track the manufacture, processing or distribution in commerce of asbestos-containing products.
- Possible sources of that information would include inquiring of the dealer/supplier or manufacturer, refer to the product's "Material Safety Data Sheet" (MSDS), or consider having the material tested by a qualified laboratory for the presence of asbestos.

DOMESTIC MINING VS. IMPORTS

- Domestic Production and Use:
 - Asbestos has not been mined in the United States since 2002, so the United States is dependent on imports to meet manufacturing needs.
 - Asbestos consumption in the United States was estimated to be 715 tons, based on asbestos imports through July 2009.
 - Roofing products were estimated to account for about 65% of U.S. consumption and other applications, 35%.
- Import Sources (2005-2008)
 - Canada – 89%
 - Other – 11%

WASTE MANAGEMENT OF ASBESTOS

The Virginia Department of Environmental Quality (DEQ) is responsible for the regulation of landfills in Virginia. Information of the management of asbestos in Virginia landfills can be obtained from the DEQ website:

<http://www.deq.virginia.gov/waste/wastereg80.html>

QUESTIONS?



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